Chapter 6
Resource Estimates

Section 301(h)(1)(G) of CERCLA requires EPA to estimate the resources needed by the federal government to complete Superfund implementation. The Agency interprets this requirement to be a report on the cost of completing cleanup at sites currently on the National Priorities List (NPL). Much of this work will occur after FY97.

Section 6.1 of this chapter includes annual information on Trust Fund resources needed by EPA and other federal departments and agencies through FY97, and on the allocation of the resources for FY97 and FY98. An overview of the method used to estimate the long-term costs associated with site cleanup is contained in Section 6.2, and an estimate of the long-term costs of cleaning up sites on the existing NPL is contained in Section 6.3. The estimate includes Trust Fund resource projections for EPA and other Superfund allocations to other federal departments and agencies for FY98 and beyond.

The long-term estimate provided in Section 6.3 is based primarily on the resources required to carry out the responsibilities and duties assigned to EPA and other federal departments and agencies by Executive Order 12580. To compute the estimate, EPA must make assumptions about the size and scope of the Superfund program, the nature and number of response actions, the level of participation by states and private parties, and the use of treatment technologies. For active NPL sites (those that have reached or passed the remedial investigation/ feasibility study [RI/FS] planning stage), these assumptions relate to management of the workload already in the remedial pipeline and the costs of those actions. For NPL sites that have not yet entered the RI/FS planning stage, assumptions are made about which activities will be necessary to clean up the sites and delete them from the NPL.

In developing the long-term resource estimate, EPA considered several sources of information:

- EPA Superfund budgets for FY93 through FY97, including budgets from other federal departments and agencies;
- The Federal Agency Hazardous Waste Compliance Docket developed under Section 120(c) of CERCLA and each federal department's and agency's annual report to Congress on federal facility cleanup as required under Section 120(e)(5) of CERCLA; and
- Various EPA information systems, primarily the CERCLA Information System (CERCLIS) and the Integrated Financial Management System.

Specifically, EPA has estimated resource needs for FY98 and beyond. This long-term effort has been coordinated with the development of the FY98 budget. In conjunction with the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and its policies affecting program direction and scope, EPA continues to refine the complete cost estimate for implementing CERCLA. The Agency is working to improve data quality, refine cost estimating methods, and collect additional information.

EPA's ability to project the federal resource requirement for CERCLA implementation improves each year as more experience is gained. Improved coordination with other federal departments and agencies and additional data on the implementation

of the federal facilities requirement of Section 120 also will increase the accuracy of future resource estimates.

6.1 Source and Application of Resources

Since the enactment of CERCLA in 1980, Congress has provided Superfund with $17.6 billion in budget authority (FY81 through FY97). This estimate includes $1.8 billion for FY81 through FY86 and $15.9 billion for the post-SARA period, FY87 through FY97. EPA spent FY97 resources on the following activities:

- EPA Response Activities (65 percent): Response activities include site assessment, time-critical and non-time-critical removals, long-term cleanup actions, and program implementation activities. Also included is support provided by the Office of Water and the Office of Indoor Air and Radiation.

- Other Federal Agencies Response Activities (11.2 percent): Agencies included are: Department of Agriculture, Department of Commerce, Department of Defense, Department of Energy, Federal Emergency Management Agency, General Services Administration, Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, National Institute of Environmental Health Sciences, Department of the Interior, Department of Justice, Department of Labor, National Aeronautics and Space Administration, Tennessee Valley Authority, Department of Transportation, and Department of Veterans Affairs.

- EPA's Enforcement Activities (12.3 percent): Enforcement activities include PRP negotiations, litigation, and settlements and cost recovery efforts.

- Management and Support (9 percent): This category includes program analysis provided by the Office of Program Planning and Evaluation; personnel, contracting and financial management services from the Office of Administration and Resources Management; legal services provided by the Office of General Counsel; and the audit function provided by the Office of the Inspector General.

- Research and Development (2.5 percent): Research and development resources are used for technical support and for developing and evaluating faster, better and less expensive methodologies and technologies in the areas of site characterization, risk assessment, monitoring, remedy selection and remedy design,

Exhibit 6.1-1
EPA Superfund Obligations
(in Millions)

Program Area	FY96 Operating Plan	FY97 Operating Plan
Response Activities (Total)	$1,202.7	$1,063.1
EPA	1,054.7	906.2
Other Federal Agencies	148.0	156.9
Enforcement Activities	141.1	171.2
Management and Support	125.6	124.9
Research and Development	20.5	35
Total Superfund	$1,489.9	$1,394.2

Source: Senior Management Report FY97.

construction and operations.

Exhibit 6.1-1 presents a snapshot of the allocation of Superfund resources for FY96 and FY97 within these categories. The snapshot data is from EPA's Senior Management Report.

6.1.1 Estimating the Scope of Cleanup

Site cleanup is the single largest category of Superfund expenditures and is expected to remain so in the future. To project EPA funding needs for cleanup activities, several key estimations were made, including:

- The projected number and average cost of studies, remedial designs (RDs), and remedial actions (RAs) undertaken;
- The extent and cost of removal activity; and
- The proportion of direct cleanup actions undertaken by PRPs.

6.1.2 PRP Contributions to the Cleanup Effort

The most significant way PRPs contribute to the hazardous substance cleanup effort is by conducting and financing response actions (whether voluntarily or under order). When PRPs finance site cleanup efforts, potential EPA Superfund obligations for those sites are dramatically reduced and the remaining principal cost is PRP oversight. EPA continues to develop and implement policies designed to encourage PRP cleanups.

In addition to response actions actually performed by PRPs, a portion of the costs of certain Fund-financed response actions will be recovered from PRPs through enforcement activities. Typically, there are delays of several years between expenditures from the Trust Fund and recovery of costs.

6.2 Resource Model Assumptions

Estimating the cost of cleaning up current NPL sites depends on a number of factors, many of which will change as the program continues to mature. The main factors are:

- Changes in Superfund program policies and procedures because of the revised NCP, particularly the cleanup standards as required under Section 121 of CERCLA;
- Changes in the remedial program because of revisions to the Hazard Ranking System, as required under Section 105 of CERCLA;
- The long period required to identify, develop, select, and construct a remedy, and the need for scheduling flexibility to maximize the impact of enforcement activities;
- The level of state Superfund program activity;
- The level of PRP participation in the program;
- Changes in cleanup approaches, such as implementing more early actions in favor of remedial actions; and
- The nature of and demand for removal actions.

Based on these factors, EPA uses the Outyear Liability Model (OLM) to estimate the long-term resource needs of the Superfund program. The OLM provides meaningful long-range forecasts, has the flexibility to refine forecasts, and can be adjusted for a large number of program-related variables. These variables can be individually adjusted to reflect actual or anticipated changes in the program. The four primary cost categories used in the OLM to estimate the long-term resources required to clean up the existing NPL sites are:

- Active NPL sites;
- NPL sites where the remedial process has not yet begun;
- Non-site activities; and
- RA costs.

EPA's estimate of resources required to clean up the existing NPL sites is provided in Section 6.3. To

develop this estimate, the Agency has concentrated on remedial and removal activities. These activities are the major components of the Superfund program and account for the majority of Fund expenditures by the Agency.

6.2.1 Active NPL Sites

Remedial efforts are underway at most of the sites on the current NPL. Remedial plans are being developed for the remaining sites on the NPL, leaving 55 sites on the existing NPL pending study at the end of FY97.

Data on the active NPL sites are stored in CERCLIS and incorporated into the OLM to present the most accurate picture of planned activities. The OLM estimates ancillary activities for sites at which some level of planning or remediation activity is underway. Because most of the existing NPL sites are active, they constitute a large portion of the total liability estimate.

In addition to planned remedial activities, enforcement activities have a significant impact on the costs of addressing Superfund sites. All enforcement activities are estimated by the model according to past program experience and several standard sequences of activities, each representing a different enforcement approach. Enforcement-related variables within the model include costs, workyears, and the shift in remedial costs when Superfund assumes responsibility from, or passes responsibility to, a PRP. As with remedial activities, most enforcement costs and workyears are estimated.

6.2.2 Sites Yet to Begin the Remedial Process

The OLM uses the same general approach for sites where the remedial process has yet to begin. Cleaning up an NPL site involves a number of different activities occurring over time and in predictable arrangements. For sites where the remedial process has yet to begin, the OLM must first approximate the activities that will be involved when remediation of the sites begins. Approximations are made by applying several generic activity sequences to the number of sites being estimated. When the activities have been set, cost and workyear pricing factors are applied to estimate the necessary resources. A consistent approach is used for all site activities, both remedial and enforcement. In the approach, tradeoffs such as avoiding cleanup costs but incurring PRP oversight costs are handled automatically as assumptions are adjusted.

The OLM includes a library of different activity sequences. Each sequence represents a typical site and involves different activities, durations, and schedules. In addition to the key activity starts discussed above, the OLM includes a number of other factors to control the mix of these activity sequences.

6.2.3 Non-Site Costs

Although non-site activities comprise a substantial portion of the budget, individually they are fairly small and stable. For these reasons, resource needs for these activities are estimated by applying annual growth factors to the levels included in the requested budget for the current year.

Aside from the number of sites requiring cleanup and the cost of individual cleanups, the assumption of managerial and financial responsibility for a site has the largest potential impact on the cost of the Superfund program. There are many factors involved in establishing who is responsible for a site (referred to as the site lead), including:

- Level of emphasis on enforcement;
- Willingness of states to assume financial responsibility; and
- Cost-sharing arrangements between Superfund and the states and between Superfund and the PRPs.

The model accommodates each of these factors with one or more variables, allowing the estimation of Superfund liabilities across a wide range of site-lead and cost-sharing scenarios. Site variables include

- Proportion of sites addressed by each lead category (Fund, PRP, state, and state enforcement);
- Number of sites that are owned and/or operated by state or local governments; and
- Number of sites that follow each of several enforcement paths.

Choices among these variables generally affect both cost and duration of the program. Increases in PRP leads will ultimately result in lower Fund costs, but related litigation will substantially extend the amount of time required to reach deletion of a site from the NPL.

6.3 Estimated Resources to Complete Cleanup

As illustrated in Exhibit 6.3-1, EPA's estimate of the total liability to complete cleanup of existing NPL sites is $31.3 billion. This total includes the OLM long-term estimate of $13.6 billion for FY98 and beyond. Major assumptions shaping the long-term estimate are as follows:

- Costing sites that are only currently proposed to or listed on the NPL.
- Removal activities at sites on the NPL remain at current levels.
- The RA cost factor is estimated at $7.4 million per RA (in 1996 dollars) based on an analysis of RODs signed from 1992 through 1996.
- Program support and other non-site elements are straightlined at the levels of the current request year budget (FY98 President's budget).
- Approximately 50 percent of all new RI/FS starts will be Fund-financed.
- For non-federal facility sites, PRPs will take the lead on 75 percent of the RAs. (Because oversight is significantly less expensive than cleanup, Fund costs drop dramatically when PRPs assume financial responsibility for more cleanups.)
- No resource and programmatic assumptions for federal facility sites are included in the OLM. The OLM does not generate a resource estimate for the federal facility program.

Assumptions about the future reflect planning assumptions from the Superfund Program Management Manual and historical performance averages, both of which are revised periodically. EPA will continue to monitor developments that affect program costs. Changes will be incorporated into the model as they occur, improving depiction of future programmatic direction and refining previous analysis. OLM estimates will vary over time as a result, and subsequent editions of this Report will most likely contain revised estimates.

6.4 Estimated Resources for Other Executive Branch Departments and Agencies

The second element in fulfilling the requirements of Section 301(h)(1)(G) of CERCLA is providing an

Exhibit 6.3-1
Estimate of Total Trust Liability to Complete Cleanup at Sites on the National Priorities List
(in Billions)

	Total Allocations
FY97 and Prior	$17.7
FY98 and Beyond	$13.6
Total	$31.3

Source: Superfund Budget Documentation and Outyear Liability Model

estimation of the resources needed by other federal departments and agencies. The Superfund resource needs of the other Executive Branch departments and agencies are met through two sources: the Superfund Trust Fund and the individual federal department's or agency's budget.

Trust Fund monies are provided to other federal departments and agencies through two mechanisms:

- Interagency Budgets: EPA provides Trust Fund monies to other federal departments and agencies that support EPA's Superfund efforts. Transfers are accomplished through an interagency budget under Executive Order 12580.

- Site-Specific Agreements: EPA also provides money from the Trust Fund to other federal departments and agencies through site-specific agreements.

Federal departments and agencies also provide support to Superfund activities through CERCLA-Specific Funds and general funds of the department or agency. Exhibit 6.4-1 summarizes the other federal departments and agencies that receive Trust Fund monies. (Please see individual agency and department annual reports for specific site cleanup costs and descriptions.)

Exhibit 6.4-1
List of Departments and Agencies Receiving Trust Fund Monies

Department of Agriculture
National Oceanic and Atmospheric Administration
Department of Defense
Department of Energy
Federal Emergency Management Agency
General Services Administration
Agency for Toxic Substances & Disease Registry
National Institute for Environmental Sciences
Department of Interior
Department of Justice
Occupational Safety and Health Administration
National Aeronautics and Space Administration
Tennessee Valley Authority
Department of Transportation
Department of Veterans Affairs